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VERBAL INTERACTION PATTERNS IN CLASSES WITH TEACHERS WHO HAD PRESERVICE TRAINING IN THE USE OF INTERACTION PROCESS ANALYSIS COMPARED TO THOSE WITHOUT SUCH TRAINING

The University of Oklahoma PH.D. 1980

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THE UNIVERSITY OF OKLAHOMA

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VERBAL INTERACTION PATTERNS IN CLASSES WITH TEACHERS WHO HAD PRESERVICE TRAINING IN THE USE OF INTERACTION PROCESS ANALYSIS COMPARED TO THOSE WITHOUT SUCH TRAINING

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

BY

CHRISTIE J. SEELY

Norman, Oklahoma

1980

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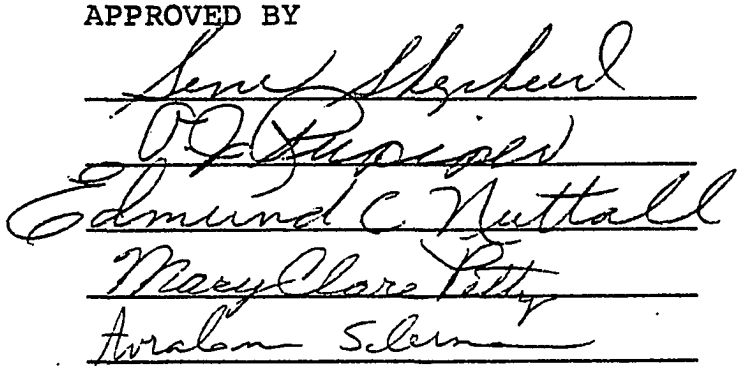
APPROVED BY



DISSERTATION COMMITTEE

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VERBAL INTERACTION PATTERNS IN CLASSES WITH TEACHERS WHO HAD PRESERVICE TRAINING IN THE USE OF INTERACTION PROCESS ANALYSIS COMPARED TO THOSE WITHOUT SUCH TRAINING

BY: CHRISTIE J. SEELY

The design of this investigation was to compare verbal interaction behaviors in classrooms where teachers had preservice training in interaction process analysis in Professional Semester II with those of teachers who had no preservice training in interaction process analysis. The intent of this investigation was to describe and compare 1) verbal interaction behavior patterns present, 2) pupil classroom attitudes, and 3) characteristic teacher behaviors.

The sample for this study was a group of six teachers who had training in interaction process analysis in Professional Semester II at the University of Oklahoma, compared to a group of six teachers who had no such training. Consideration in matching was given to number of years of experience, teaching assignment, age, gender, and grade point average.

Data collected included a systematic analysis of the verbal behaviors of teachers and pupils in a live observation using the Verbal Interaction Category System. Each teacher completed the Fundamental Interpersonal Relationships Orientation - Behavior, and all pupils completed the My Class Inventory.

Results indicated significant differences between the verbal interaction patterns of classes where the teacher had training in interaction process analysis, and the classes where the teacher had no such training. The trained teachers explained more, gave fewer directions, accepted more pupil ideas, and rejected fewer behaviors. Pupils in the classes with the trained teachers responded with more broad answers and initiated more talk to other pupils. The classes of trained teachers had more short silences and less confusion than the classes of untrained teachers. There were no significant differences between the teachers regarding characteristic behaviors, and only one area of the pupil attitude inventory was significantly different for the two groups. Pupils in classes with teachers not trained in interaction process analysis perceived their classes to be less competitive than did the pupils in classes with teachers who were trained. The verbal behaviors of the former Professional Semester II teachers and their pupils were found to be similar to those of teachers and pupils reported in previous studies.

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CHAPTER I

INTRODUCTION

The faculty of the College of Education at the University of Oklahoma has prescribed a particular set of experiences for its students in elementary education. The set of experiences which currently comprise the professional sequence began in the fall of 1977. This sequence includes a series of steps from provisional and final admittance to the teacher education program to Professional Semester II, which is the final semester before graduation.

This sequence has been designed to meet the State of Oklahoma and University of Oklahoma requirements for certification and graduation. This sequence begins with study of the social and psychological foundations of education and moves to curriculum and instruction. The courses integrate theory, practice, and public school field experience. Beginning at the time of specialization in the elementary field, this professional sequence differs in its organization from other teacher education programs.

Upon final admittance to the teacher education program and after having completed State of Oklahoma, University of Oklahoma, and College of Education social and psychological coursework requirements for certification, elementary education students enter their final two semesters of undergraduate work. The first of these semesters is called Professional Semester I, or "The Block," which emphasizes methods of teaching in the elementary school in the curriculum areas of language arts, social studies, and arithmetic. "The Block" semester both presents the uniqueness of the three curriculum areas and assists students in developing skills and strategies for integrating the areas into meaningful wholes.

Students spend a semester of half days, three a week in the college classroom preparing lessons, materials, and techniques appropriate to the elementary classroom, and two a week in working with small groups of children in public school classroom settings, using those lessons, materials, and techniques previously prepared. These field experiences are considered a major aspect of Professional Semester I and much effort goes into the task of organizing, implementing, supervising and evaluating these experiences. Professional Semester I provides students with many experiences with children to develop their teaching skills through emphasis on the integration of language arts, social studies and arithmetic.

The final semester of the professional sequence for undergraduates is Professional Semester II which is a combination of the undergraduate course in curriculum and student teaching. Students are involved in a complete semester of work. The first approximately ten days are spent in the college classroom for curriculum instruction, followed by sixteen weeks of student teaching in the public school setting. Students continue to attend class on campus one-half day a week through mid-term for curriculum instruction.

Tools for identifying, gathering, and interpreting relevant data are presented in the college classroom in order to assist the student teachers in developing their own strategies of instruction. Professional Semester II explores communication, methodology, objectives, content, and developmental perspectives; using a cycle of study, practice, and evaluation in schools and classrooms. Assignments given during the first half of the semester originate from the curriculum course and extend to the student teaching classroom where many are completed. As the semester progresses, student workload for the curriculum course decreases. After mid-term the students devote all of their time to classroom responsibilities. The notion of decreasing expectancy to meet the curriculum course requirements and increasing expectancy in student teaching activities

requires excessive energy from the students, because of emphasis changing as the semester progresses.

The undergraduate elementary curriculum course consists of classroom interaction skills, study of developmental levels, specific models of teaching, questioning patterns, and time spent observing and noting many underlying patterns that exist in the environment of the classroom. The course includes emphasis in the areas of cognition, affection, and psychomotor behaviors inherent in the elementary pupil. A detailed system of peer-group feedback using the data gathered from the observations has been developed to enhance the increasing teaching skills of the student teachers and is an essential aspect of this semester.

In studying individual teaching behaviors a system of feedback seems necessary to receive objective information regarding classroom processes. The system of peer feedback established for the Professional Semester II is built around various components: an instrument for analyzing classroom verbal interaction, i.e., interaction process analysis, a method for describing teacher questioning behaviors, Bloom's Taxonomy of Educational Objectives (1956) for identifying cognitive, affective, and psychomotor load, and specific models of teaching as compiled by Weil and Joyce (1978).

As previously mentioned, students spend approximately the first ten days of Professional Semester II in the college classroom. During these days they are required to memorize and practice the codes of the instrument for systematically analyzing verbal interaction behaviors. In order to practice the coding and interpretation of the coding of the interaction instrument, students peer teach prepared model lessons, with one student teaching the lesson, several students participating as pupils, and several students coding the verbal interactions, recording question types, and checking the steps of the model lesson. Following the model lessons all students participate in peer-group feedback sessions where observed behaviors are discussed and related to the objectives of the lesson, the performance of the teacher regarding verbal interactions used, and the appropriateness of the lesson to developmental levels of the learners.

Following the initial days of the semester, students begin reporting to their student teaching centers. To facilitate observation/feedback student teachers are assigned in groups of least three per center. Upon reporting to their student teaching assignments, student teachers are required to observe and analyze lessons taught by peers in the same manner as that of the previous on-campus training. Again they participate in peer-group feedback of specific model lessons and verbal behaviors continuing through midterm. Students are

encouraged to observe and provide feedback for one another throughout the entire semester.

Statement of the Problem

This investigation was designed to compare verbal interaction behaviors in classrooms where teachers had preservice training in interaction process analysis in Professional Semester II with those of teachers who had no preservice training in interaction process analysis. The intent of this investigation to to describe and compare 1) verbal interaction behavior patterns present, 2) pupil classroom attitudes, and 3) characteristic teacher behaviors.

The proposed investigation was pseudo-experimental in nature, i.e., "an experiment in which the independent variable is nonmanipulated, but in which the experimenter actively selects naturally occurring levels of the independent variable to observe" (Harrison, 1979, p. 375). The investigation incorporated data from those classes with teachers previously instructed in the use of interaction process analysis and who were teaching in an elementary classroom at the time of the study compared to that of classes whose teachers had no background in interaction process analysis. All participants were located in central Oklahoma school districts.

An assumption basic to this investigation was that those classes with teachers who had preservice training in interaction process analysis would display different verbal interaction behavior patterns from those of teachers with no such training. Another assumption rested within knowledge that verbal interaction behavior patterns existed between teachers and pupils and that training in interaction process analysis would enhance this knowledge, which would affect the verbal interaction behavior patterns of the members of the classes and the attitudes of pupils toward their classes. Additional consideration was given to the relationship of pupil classroom attitudes and the characteristic behaviors of their teachers. The population of trained teachers involved was an intact, isolated group previously submitted to interaction process analysis training.

Questions

Answers were sought for the following questions posed:

1. Were there differences among verbal interaction behavior patterns of pupils and teachers where the teachers had no interaction process analysis training?

2. Were there differences among verbal interaction behavior patterns of pupils and teachers where the teachers had preservice training in interaction process analysis?

3. Were there differences between verbal interaction behavior patterns of pupils and teachers where the teachers

had preservice training in interaction process analysis and that of pupils and teachers where teachers had no such training?

4. Were there differences among the characteristic behaviors of teachers without preservice training in interaction process analysis?

5. Were there differences among the characteristic behaviors of teachers with preservice training in interaction process analysis?

6. Were there differences between the characteristic behaviors of teachers with preservice training in interaction process analysis and the characteristic behaviors of teachers without such training?

7. Were there differences among the classroom attitudes of pupils with teachers without preservice training in interaction process analysis?

8. Were there differences among the classroom attitudes of pupils with teachers with preservice training in interaction process analysis?

9. Were there differences between the classroom attitudes of pupils with teachers with preservice training in interaction process analysis and the classroom attitudes of pupils with teachers without such training?

Background and Need

Amidon and Giammatteo (1965) conducted a study concerned with the verbal behavior patterns of 33

elementary teachers rated as superior or master teachers by their supervisors and administrators compared to an average group of teachers selected at random. They found that the superior teachers talked less, used student ideas more, used criticism and direction-giving less, used broader questions, and had more student participation in class than the average classroom teacher. Since interaction process analysis dealt with these particular behaviors it was assumed that the verbal behaviors of teachers with preservice training would show a significant difference from those who did not have the preservice training.

In their book, Teacher-Student Relationships: Causes and Consequences, Brophy and Good (1974) emphasized the need for investigations of teacher-student relationships in real-world settings. "We also hope to see more research in which the investigator works cooperatively with the teacher . . . by observing him naturalistically and then discussing classroom events with him, . . ." (p. ix). Professional Semester II has emphasized the use of observation/feedback to analyze classroom environments as suggested by Brophy and Good.

A tool designed for use in the real-world setting and used in Professional Semester II for identifying, gathering, and interpreting classroom verbal interaction was the Verbal Interaction Category System (VICS), developed by Edmund Amidon and Elizabeth Hunter (1967).

> The VICS provides four codes to account for the performance of teachers in initiative communication: providing information, giving directions, asking narrow questions, and asking broad questions. It also has several codes for pupil talk: short, factual, predictable answers; longer, less predictable responses; initiated responses to other pupils; initiated responses to the teacher. The VICS also codes the teacher responses back to pupil communication as being either the acceptance or rejection of ideas, behaviors, or feelings (Ragan and Shepherd, p. 175).

At the time of this investigation only one research study had been conducted as a follow-up of Professional Semester II. Hayes (1977) studied the effects of the knowledge of interaction process analysis on the expectations of pupils by their student teachers. Research dealing with teacher expectations (Brophy and Good, 1974) indicated that a student teacher's expectations of the pupils in the classroom tended to become like or nearly like that of the cooperating teacher. Hayes' attempted to determine if knowledge of a system of interaction process analysis was significantly related to student teacher attitudes and attributions toward pupils, and if there was a significant relationship between student teacher and cooperating teacher attitudes and attributions toward pupils (pp. 4-6). He found that student teachers with a higher knowledge of interaction process analysis were less influenced by the attitudes of their cooperation teachers toward pupils (p. 97).

A study dealing with the relationships of teachers and pupils in classroom settings, using those teachers

who were products of observation/feedback training as presented in Professional Semester II, had not been conducted. Such a study could assist in determining the merit of a specific teacher training experience and could be used to reinforce the program, to reconsider its value, perhaps to encourage interest in or a basis for further research, and would add to the number of studies done in classroom settings.

Other aspects of verbal interaction behavior patterns in classrooms were studied. How the teacher saw himself/herself relating to others was viewed in regard to these patterns. Perhaps classes that differed with regard to their verbal interaction behavior patterns had teachers that also differed with regard to how they saw or would like to see themselves relating to others.

The attitudes of students toward their learning environments were investigated. Classroom attitudes of pupils whose teachers had training in interaction process analysis were compared to those of pupils whose teachers had no such training.

Definitions

1. Student refers to any university level person enrolled in a teacher education program.

2. Student teacher refers to those university students involved in working in a public school classroom with a regular teacher for the purpose of practicing

teaching skills under the supervision of the classroom teacher.

3. Cooperating teacher refers to the experienced regular classroom teacher to whom a student teacher is assigned.

4. Pupil is used to refer to the elementary school child with whom the students work.

5. Preservice is that time spent by university students preparing to become classroom teachers.

6. Interaction process analysis is the term used to define a method of studying the occurrence of verbal behaviors between teachers and pupils, and between pupils and other pupils.

CHAPTER II

REVIEW OF RELATED LITERATURE

Typical classrooms have much verbal interaction going on in the form of talk by teachers and pupils, centered mainly on the teacher (Edwards and Furlong, Amidon and Flanders, Hennings, Brophy and Good, and Gorman). When young people and adults interact it is the adult, in this case the teacher, who completely controls the interaction. "Teachers normally tell pupils what to do, how to do it, when to start, when to stop, and how well they did whatever they did" (Flanders, 1970, p. 4). Traditional classroom settings maintain a central area of communication with the teacher as the focus. Pupil talk is directed to the teacher who is situated so as to be able to direct his/her talk to any place in the room. Teacher talk is pervasive and designed to get desired results. Pupil talk has a limited range of possible behaviors (Edwards and Furlong, 1978). Two-thirds of the time in a classroom, someone is talking. Two-thirds of the talk is done by the teacher and two-thirds of the teacher's talk is giving opinions, facts, some direction, and criticism (Flanders, 1963).

In regard to questioning by teachers, Edwards and Furlong (1978) suggested that the teacher maintained control of the interaction by asking more narrow than open questions; open questions led to more pupil talk that was unpredictable and which could not be stopped as the teacher wished. In questioning situations the teacher talked every other turn and transmission of knowledge was controlled by the teacher.

Flanders (1970) found that high achieving classes had teachers who encouraged a greater variety of verbal interactions in their classes. These teachers used pupils' ideas more through acceptance and clarification of the pupils' ideas. "There is a possibility that teacher response to pupil ideas is an essential feature of discourse which reaches higher levels of logic during classroom discussion" (p. 335).

Flanders (1967) defined indirect teaching behaviors as those that included the use of pupils' ideas, accepting feelings, and praising and encouraging; and direct teaching behaviors as those that included lecturing, giving directions, and criticizing or justifying authority. Bennett (1976) summarized evidence from observational studies at the elementary level as follows:

> 1. Although the evidence is equivocal it would appear that indirect (and/or less hostile) teacher behaviors are generally more conducive to pupil growth on most achievement measures.

> 2. There is a possibility that those relationships may vary or be non-linear, depending upon (i) the task complexity of the achievement measure, (ii) grade level and (iii) level of ability of pupils.
> 3. There is evidence that these relationships may be mediated by the anxiety level of pupils.
> 4. Indirect teaching behaviors appear to generate more positive attitudes to school and schoolwork (pp. 27-28).

Good and Brophy (1973) described the importance of praise by teachers. "Students will be encouraged by a teacher and motivated to work for him if they know that he sees and appreciates their efforts and progress" (p. 182). They went on to say that teachers more readily commented about undesired behaviors through criticism.

Later, a two year study by Brophy and Evertson (1976) attempted to generate data to support reasons why the pupils of some teachers got more cognitive growth than did those of other teachers. The set of measures used included one for the analysis of verbal interactions. They found that, contrary to textbook writers and behaviorists, praising children was not necessarily good, nor that criticizing was necessarily bad, and that "under certain circumstances, 'relatively' low rates of praise and high rates of criticism indicated both good student performances and good teacher-student relationships" (p. 103).

Following the review of nine different studies Rosenshine (1968) concluded, "There is no evidence to

support a claim that a teacher should avoid telling a pupil that he is wrong or should avoid giving him academic directions. However, teachers who use a good deal of criticism appear consistently to have classes which achieve less in most subject areas" (p. 4).

Hurt, Scott, and McCroskey (1978) discussed the impact of meeting pupils' communication needs in the classroom. The needs for social inclusion, behavior control, and affinity were all facilitated by teachers who allowed for the acceptance and encouragement of pupil ideas. A democratic teaching style, wherein pupil ideas were used and encouraged, provided maximum probability of students satisfying these needs (p. 184).

Based on research studies of teaching performances from 1900 to 1952, Morsh and Wilder concluded the following:

> No single, specific, observable teacher act has yet been found whose frequency or percent of occurrence is invariably and significantly correlated with student achievement. There seems to be some suggestion, however, that a) questions based on student interest and experience rather than assigned subject matter, b) the extent to which the instructor challenges the students to support ideas, and c) the amount of spontaneous student discussions, may be related to student gains (p. 4).

Though little research expressly in interaction process analysis was done before 1950, effective teaching was related to classroom verbal interaction in this conclusion.

Flanders (1970) maintained that much research showing this relationship had been made possible by the development of ways to systematically analyze what was happening in the classroom (p. 6). Simon and Boyer (1974) had compiled ninety-nine instruments that were used to analyze classroom behaviors.

Hennings (1975) discussed the importance of first-hand, systematic analysis of verbal communication in the classroom. She stressed the need for teachers to study the verbal behaviors of others, as well as their own, to develop insight into the role of verbal interaction and to increase their communication competencies with pupils. Hennings pointed out that teachers needed to be highly skilled in sending and receiving messages in the classroom since communication was central in teaching. Information with regard to the amount of freedom extended by the teacher to pupils can be described by study of pupil response/initiation patterns.

> The classroom in which student talk is limited to responses to the teacher is probably one in which children or young people are given little freedom to initiate ideas; conversely, the classroom in which students actively respond to other students and initiate may be one in which students are encouraged to share thoughts with one another, raise questions, and give directions" (pp. 82-83).

The system for analyzing verbal behavior in the classroom developed by Flanders in 1960, was cited again and again by researchers in the field, and had been

used as a tool for much research. Others had developed verbal interaction analysis techniques based on Flanders' instrument.

In light of a systematic analysis of classroom environments, Ober, et. al., (1971) stated the following assumptions about the teaching-learning process:

> 1. The teaching-learning situation is made up of related but identifiable variables that can be classified, measured, and studied.
> 2. Systematic study of classroom events can be attained by trained observers.
> 3. Systematic study of teaching-learning situations can aid teachers in acquiring and sharpening certain skills enabling them to identify and control their behaviors. (p. 4).

With regard to the development of tools for the analysis of classroom situations Ober stated:

> The new methods of measurement that are a result of working toward understandable and reachable goals have been impressive, and the trends toward improving the teaching-learning situation itself are heartening. The use of techniques such as simulation and systematic observation are moving the teaching process away from the realm of unexplainable, 'hit-or-miss' interaction toward a process that can be objectively planned, observed, assessed, modified, and executed (p. 3).

Gorman (1974) pointed out the usefulness of verbal interaction analysis as a way for teachers to objectively find out about and clearly see the types and frequencies of verbal behaviors going on in their classrooms. He added that interaction analysis allowed teachers to consider what they would like to have going on in light of their objectives (p. 89).

Amidon and Hunter (1967) reported that classroom verbal behavior was quite similar for most teachers and for most pupils. By becoming aware of their verbal behaviors teachers could better facilitate learning in their classrooms. In order to better select appropriate verbal behaviors to achieve particular goals, systems for analyzing classroom talk had been developed.

In discussing why he felt it was imperative that teachers studied their own classroom behaviors, Amidon (1963) stated:

> The primary responsibility of the classroom teacher is to guide the learning activities of children. As he helps children to learn in the classroom situation, the teacher, as the leader, interacts with the children both as individuals and as a group. In the process of this interaction he influences the children, sometimes intentionally with planned behavior, sometimes consciously without planning, but often without awareness of his behavior and the effect of this behavior on the learning process (p. 1).

Because of the major influence of the teacher in the classroom, Amidon felt that when the teacher had the tools for analyzing his own behaviors, he could consciously set about changing the behaviors he found undesirable. A specific tool for analyzing verbal behavior in the classroom would give the teacher objective information for consideration.

Amidon and Hunter based their work on that of Flanders and designed the Verbal Interaction Category System with particular interest in its use in teacher

education. "The VICS is offered in the hope that it will liberate practitioners from teaching that is too often imitative or instinctual rather than thoughtful and original" (p. 10).

Various studies had been conducted to test the effectiveness of training in interaction analysis on shaping the teaching behaviors of preservice teachers. Favorable results were reported by most researchers.

Kirk (1964) trained fifteen student teachers in interaction process analysis in a seminar preceeding student teaching. Another group of fifteen student teachers were involved in a traditional pre-student teaching seminar. He found that the group which received interaction analysis training talked less in their classes, gave fewer directions, tended to be less direct; pupils perceived them as becoming more indirect and talking less with time; they used varied teaching behaviors more than the student teachers who were involved in the traditional seminar.

Hough and Amidon (1963) trained one group of secondary education students in the use of Flanders' System of Interaction Analysis, while another group was taught learning theory application. Both groups practiced using the techniques involved in their respective training models. They found that the student teachers who received interaction analysis training made significant

positive attitude changes toward teaching, and were rated higher by their college supervisors.

Furst (1965), in a follow up study to Hough and Amidon, compared three groups of student teachers. One group was trained in interaction analysis before student teaching, one group was trained in interaction analysis during student teaching, and one group received no training in interaction analysis. She found that training before or during student teaching had no effect on verbal behavior differences, but that the training itself did. Student teachers with interaction analysis training used less rejection of pupil behavior, more acceptance of student ideas, and allowed more pupil talk.

Hough and Ober, in 1966, compared the verbal behaviors of classes taught by two groups of preservice teachers. Both groups were given training in a variety of teaching skills, with one group receiving training in interaction analysis. Their findings indicated distinct differences:

> Subjects taught interaction analysis were found to use, in their teaching simulations, significantly more verbal behaviors that have been found to be associated with high student achievement and more positive student attitudes toward their teachers and school. These same subjects were found to use significantly fewer behaviors that have been found to be associated with lower achievement and less positive attitude (Ober, 1971, p. 8).

In two follow up studies of the Hough-Ober study, the same subjects were used. Lohman, in 1966, reported:

> . . . the student teachers who had been trained in interaction analysis: 1) accepted and clarified feelings more; 2) praised and encouraged student action and behavior more; 3) accepted and clarified student ideas more; 4) lectured less; 5) gave fewer directions; 6) used more verbal behaviors associated with motivation of students (Ober, 1971, p. 34).

Also reported was that in classes of student teachers with interaction analysis training significantly more spontaneous pupil talk was present.

Flanders (1970) reported that teachers became more responsive to pupil ideas when trained in using a system of interaction analysis and, and flexibility of teaching behaviors increased. In discussing his system of interaction analysis, Flanders wrote, "The technique was first developed as a research tool, but every observer we ever hired testified that the process of learning the system and using it in classrooms was more valuable than anything else he learned in his education courses" (Yee, p. 397).

Spurrier and Lowe (1979) instructed nineteen secondary home economics and twenty elementary education student teachers in discussion techniques and interaction analysis prior to their student teaching semesters. Their college supervisors observed them teaching twice, once at the beginning of the semester and once at the

end, using Flander's System of Interaction Analysis. An observation of the cooperating teachers was also made. Statistical analysis revealed that the student teachers encouraged students more, asked more questions, lectured less, and criticized pupils less than did the cooperating teachers. There were significantly more silences in the elementary student teachers' classrooms.

Harrison (1976) attempted to explain high class achievement in reading by analyzing teacher characteristics and teacher behaviors. Twenty-four second- and third-grade women teachers were divided into two groups: 1) successful - those with mean class gains in reading of at least a year, and 2) unsuccessful - those with a mean class gain of less than a year. Her research indicated, among other variables, that the successful teachers lectured one-fourth less time than the unsuccessful teachers. Harrison's research also indicated that the successful teachers employed higher, more abstract levels of conceptual thinking.

Kline and Sorge (1974) looked at ten graduate students with from 0 - 9 years teaching experience and found that teachers not trained in interaction analysis, but given interaction analysis feedback showed

> (a) a 30.6 percent net gain in indirect teaching based on the difference between the first two observations and the sixth, and a net gain of 35.6 percent based similarly between the first two observations and the fifth and sixth observations

> (b) a significant increase in the acceptance and use of pupil ideas
> (c) an increase in the amount of questioning with significant increases in the amount of convergent questioning
> (d) a significant decrease in amount of time spent lecturing
> (e) significant increases in student talk, specifically, convergent and divergent responses (p. 55).

Wood and Larsen (1976) assessed the variations in teaching styles, i.e., direct vs. indirect, on the enhancement of creativity in sixty first-grade subjects. The pupils were given a pre- and post-test creativity measure. Increases in responses were compared in light of pupil membership in classes classified as direct or indirect. Amidon and Flanders Interaction Analysis System was used to analyze classroom verbal behaviors, the results of which were related to scores on the Wallach and Kogan measure of creativity. "The results suggest that creativity as defined by Wallach and Kogan can be positively affected by naturally occurring differences in teaching styles" (p. 220). The number of unique responses increased significantly more for the pupils in the indirect classes.

Firestone and Brody (1975) observed the verbal behaviors of seventy-nine children in the second semester of kindergarten and again in the first half of first grade. They used the Medley and Mitzel Category System, a modification of Flanders' system, to analyze classroom interactions. The effects of the teachers' verbal

behaviors were related to pupil achievement on two academic achievement measures. The pupils were given an IQ test while still in kindergarten. Results indicated a significant relationship between the amount of negative interactions and poor performance on all subtests of the Metropolitan Acievement Test, IQ accounted for. Children with more positive interactions related positively to math achievement, word knowledge and total reading scores.

The study by Amidon and Giammatteo (1965) mentioned earlier systematically analyzed the verbal behaviors of thirty-three elementary teachers considered superior by their principals and supervisors.

> The results indicated that the verbal behavior patterns of superior teachers do differ substantially from those of average teachers. The superior teachers talked approximately 40% of their total class time, while the normative group talked approximately 52% of the time. The superior teachers were more accepting of student-initiated ideas, tended to encourage these ideas more, and also made more of an effort to build on these ideas than did the average group of teachers. The superior teachers dominated their classrooms less, used indirect verbal behavior more, and used direction-giving and criticism less than the normative group of teachers. The superior teachers asked questions which were broader in nature than the normative group, and their lectures were interrupted more by questions from the students. There was about 12% more student participation in the classes of the superior teachers (p. 285).

Mackey, et. al., (1977) studied the relationship between cumulative grade-point average (CGPA) and ratings by supervising teachers. Four hundred forty-two student teachers in high, middle, and low grade point groups were rated over a period of two years, on nine teaching performances. Significant differences were found on three of the group means: subject command, general information, and overall evaluation. There was a significant difference between the middle and high groups with regard to subject command; there was significant difference between the low and middle and between and between the middle and high groups with regard to general information; and there was a significant difference between the low and middle groups with regard to overall evaluation. Elementary teachers scored higher than secondary teachers on English usage, organization, and subject command. Significant differences when considering sex of the student teachers appeared only in English usage. Females were rated higher. "Low CGPA was more predictive of low student teaching ratings than were the middle or high CGPA's predictive of either middle or high performance in student teaching" (p. 273).

The literature related to interaction process analysis tended to fall into three broad categories: 1) description of classroom verbal behaviors, 2) the effects of training in interaction process analysis on the verbal

behaviors of teachers and student teachers, and 3) the effects of teacher verbal behaviors on pupil performance and pupil classroom attitudes. Significant differences in the verbal behaviors of teachers and student teachers trained in interaction process analysis were reported. Teachers trained in interaction process analysis talked less, used pupil ideas more, gave fewer directions, and asked more questions. Pupil academic performance and classroom attitudes were significantly more positive in calssrooms where the teachers used their ideas, accepted their feelings, and praised and encouraged them more.

CHAPTER III

METHOD

As discussed in Chapter I, the proposed investigation was pseudo-experimental in nature. The investigation incorporated data from those classes with teachers previously instructed in the use of interaction process analysis and who were teaching in an elementary classroom at the time of the study compared to that of classes whose teachers had no background in interaction process analysis.

Subjects

The experimental group for this investigation consisted of pupils and their teachers, who as students received a course grade of "A" in the undergraduate curriculum course that was a part of Professional Semester II. The sample selected from this population was necessarily purposive in nature, in that it was selected from a population with atypical or particular characteristics. "In purposive/expert choice sampling, experts choose 'typical' or 'representative' cases on the assumption that with judgment and reason a satisfactory sample can be chosen" (Dyer, 1979, p. 95).

The teachers selected for the experimental group were identified by using the class roles of Professional

Semester II during the semesters in which interaction process analysis was taught: Fall, 1977; Spring, 1978; Fall, 1978; and Spring, 1979. A random sample of six classes was selected from the group taught by previous students of Professional Semester II, with an alternate class subsequently selected.

The control group teachers, those without interaction process analysis instruction, were matched with the experimental group teachers on the basis of number of years of experience, similar degrees, teaching assignments, age, gender, and college grade point average. Because it is the nature of first grade classes to work in smaller time units than were required, those classes were not included in the sample. All participants were selected from elementary schools in central Oklahoma.

Instruments

1. Fundamental Interpersonal Relations Orientation - Behavior (FIRO-B), developed by William Schutz (1967), is an instrument which generates data dealing with expressed and wanted characteristic behaviors of individuals. The term "expressed" refers to those behaviors perceived by the individual to be a part of his personality. "Wanted" refers to those behaviors the individual would like others to see in his personality. Three fundamental dimensions of interpersonal relationships are reflected in the

fifty-four items of the FIRO-B: Inclusion (I), Control (C), and Affection (A). Each dimension speaks to the need of an individual to bring about and continue in a relationship with people that is satisfactory with respect to interaction and association (I), the control and power of the decision-making process (C), and to love and affection (A). It was hoped that the FIRO-B measure would confirm that there were no basic personality differences among the teachers which would influence the results of the study.

Reliability of the FIRO-B, a Guttman Scale, was established through computing the reproducibility (predictability) of the six scales and was developed on about one thousand subjects.

> . . . reproducibility is a more stringent criterion than the usual internal consistency measures, since it requires not only that all items measure the same dimension - i.e., that they be unidimensional - but also that the items occur in a certain order (Schutz, p. 8).

A reproducibility mean score was calculated and yielded .94 for the items on the FIRO-B. A coefficient of stability, reflecting test and retest scores, produced a mean coefficient on the six scales, $r_{\bar{x}} = .76$. Since the FIRO-B is a Guttman Scale, content validity is necessarily a property. (See Appendix A)

2. My Class Inventory (MCI) is an instrument developed by Gary Anderson and Herbert Walberg (1968) to measure perceived student classroom environment. Forty-five items relate to five categories: 1) satisfaction -

whether or not pupils like their class; 2) friction - perceived disagreement, tension, and antagonism; 3) competitiveness - perceived competition between pupils; 4) difficulty - perceived level of difficulty of classroom work; 5) cohesiveness - a feeling of intimacy that develops when several individuals interact for a period of time. Reliability of the MCI was established through computing individual scale scores and reflected $r_{\bar{x}} = .62$, based on data from 655 subjects (Anderson and Walberg, pp. 28-29). (See Appendix B)

3. Verbal Interaction Category System (VICS) was designed by Edmund Amidon and Elizabeth Hunter (1967), and is a tool for determining the verbal interaction patterns taking place in a classroom through systematic observation, coding and interpretation of verbal behaviors. The VICS is based on the interaction process analysis procedures developed by Ned Flanders (1960). A trained observer, in this case the researcher, numerically codes the live verbal interaction behaviors in the classroom at three second intervals and whenever the verbal behavior changes if less than three seconds. The seventeen categories and codes of the VICS are as follows:

	Code	Category
Teacher Talk	1	Explaining
	2	Direction
	3	Asking Narrow Question
	4	Asking Broad Question
	5a	Accepting Pupil Idea
	5b	Accepting Pupil Behavior
	5c	Accepting Pupil Feeling

	6a	Rejecting Pupil Idea
	6b	Rejecting Pupil Behavior
	6c	Rejecting Pupil Feeling
Pupil Talk	7a	Responding to Narrow Question
	7b	Responding to Broad Question
	8	Responding to Another Pupil
	9	Initiating Talk to Teacher
	10	Initiating Talk to Another Pupil
Other	11	Silences During Discussion
	12	Confusion

A more detailed description of the VICS codes are found in Appendix C. Coding produces a chain of verbal interaction behaviors which are then tallied on a matrix from which totals of particular verbal interaction behaviors and patterns can be read.

The systematic coding of well defined verbal behaviors is considered "low inference coding," i.e., that the person coding does not have to make inferences of judgments about the observed behaviors.

> Low inference methods generally are preferred over high inference methods because high inference methods are open to the same kinds of biasing influences that make high inference ratings unreliable as measures of teacher effectiveness (Brophy and Evertson, p. 176).

Procedures

Classes selected to participate were observed when the stated purpose of the lesson was that of reviewing a previously taught lesson where verbal interaction was ongoing and which lasted at least twenty-five minutes. Coding began five minutes into the lesson to allow for teacher and student adjustment to the observer and for

normal interactions to flow. Each classroom setting was observed with VICS coding in operation during the period of April 8 - April 30, 1980. The VICS codes for each observation were chained and interpreted according to procedures outlined by Amidon and Hunter (1967).

During the same weeks of observation each pupil in the class was asked to complete the MCI. The items were read aloud to insure comprehension by all pupils. The classroom teacher was asked to complete the FIRO-B.

Scott's coefficient (1955), as adapted by Flanders (1960), was used to estimate observer reliability. Prior to the study, a weekly coding of a video-taped classroom lesson where verbal interaction behavior was ongoing was used for practice to develop consistency in coding the verbal behaviors. During the study the same video-taped lesson was coded to ascertain reliability. A reliability of .91 or above for codings and re-codings was established and maintained before and during the data gathering period. During the actual classroom observations, audio tape recordings were made and re-coded following the live codings. (See Appendix D)

Analysis

The data gathered by use of the VICS instrument were translated into proportions of behaviors observed and recorded reflecting six categories: teacher initiated

talk, student initiated talk, question types, student responses, reinforcement, and other verbal behaviors. Differences between proportions of the experimental and control groups were used to calculate z scores. These scores indicated if statistically significant differences existed between the classes of the teachers with VICS training and those of the teachers without the training for each of the categories.

A t-test of differences between mean scores of the data generated by the MCI and the FIRO-B for the classes with teachers with and without VICS training, respectively, was used to determine the significance of differences. Scores at or beyond the .05 level of confidence were considered significant.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Presentation of Data

The data for this study were collected during a predetermined three-week period plus an additional three days. One of the teachers originally selected with preservice training in interaction process analysis chose not to participate and an alternate who met the criteria had to be identified and scheduled for participation. Twelve classroom teachers contributed to the FIRO-B data and all pupils present the day of the VICS observation for each classroom contributed to the MCI data.

Verbal Interaction Category System Data

Data gathered using the VICS instrument were tabulated indicating the frequency of the verbal behavior patterns being studied. The frequencies were converted to proportions to allow for comparisons for the classes of the six teachers without previous interaction process analysis training (control), and for the classes of the six teachers with previous interaction process analysis training (experimental). Significance of the differences between the proportions of the two sets of classes was

tested through calculation of z scores. Table 1 presents the descriptive and statistical VICS data and reflects all teacher talk (explaining, directing, asking questions, and reinforcing), all pupil talk (responding and initiating), and all other talk (silences and confusion).

TABLE 1

VICS PROPORTIONS, DIFFERENCES, STANDARD ERROR OF THE DIFFERENCE OF THE PROPORTIONS AND z SCORES

Category	Control N	Control p	Experimental N	Experimental p	Diff	SE_{D_p}	z Score
All Teacher Talk	924	.65	893	.61	.04	.02	1.86
All Pupil Talk	442	.31	528	.36	-.05	.02	-2.50*
All Other Talk	48	.034	40	.027	.007	.008	.86

* Significant at or beyond .05 level.

Differences in all pupil talk yielded a z score of -2.50 which was statistically significant with $P < .05$. Experimental classes had significantly more pupil talk than the control classes. The statistical analysis of all teacher talk and all other talk indicated no significant differences.

Table 2 presents the descriptive and statistical data for the subsets of verbal behaviors within the set of all teacher talk. Statistically, the experimental

classes had significantly more teacher explaining behaviors, yielding a z score of -4.12, with $P < .05$, and significantly less teacher direction giving, yielding a z score of 5.09, with $P < .05$. Though the experimental teachers asked more broad questions and fewer narrow questions than the control teachers, there were no statistically significant differences regarding questioning behavior patterns between the two groups.

TABLE 2

VICS PROPORTIONS, DIFFERENCES, STANDARD ERROR OF THE DIFFERENCE OF THE PROPORTIONS AND z SCORES FOR TEACHER TALK: EXPLAINING, DIRECTING, QUESTIONING AND REINFORCING

Category	Control N	Control p	Exper. N	Exper. p	Diff	SE_D p	z Score
Explaining	192	.14	260	.18	-.04	.001	-4.12*
Directing	91	.07	36	.02	.05	.010	5.09*
Questioning							
Narrow	226	.15	193	.13	.02	.018	1.06
Broad	48	.03	55	.04	-.01	.011	- .91
Reinforcement							
Accepting							
Ideas	154	.11	211	.15	-.04	.010	-3.85*
Behaviors	98	.07	79	.05	.02	.015	1.36
Feelings	00	.00	00	.00	.00	.000	.00
Rejecting							
Ideas	34	.024	32	.022	.002	.017	.12
Behaviors	81	.06	27	.02	.04	.007	5.66*
Feelings	00	.00	00	.00	.00	.000	.00

* Significant at or beyond .05 level.

There were statistically significant differences between the groups with regard to verbal reinforcement behaviors. Experimental teachers accepted pupil ideas

significantly more than the control teachers, $z = -3.85$, with $P < .05$. Control teachers accepted more pupil behaviors than did the experimental teachers, but not significantly so. There was no statistically significant difference between the two groups with regard to rejection of pupil ideas, but the control group rejected significantly more pupil behaviors than did the experimental teachers, $z = 5.66$, with $P < .05$.

Table 3 presents the descriptive and statistical data for the subsets of verbal behaviors within the set of all pupil talk. Statistically, pupil response to narrow questions from the teacher was significantly greater in the control classes, $z = -3.80$, with $P < .05$, while pupil response to broad questions from the teacher was significantly greater in the experimental classes, $z = -3.95$, with $P < .05$. There was no statistically significant difference between the classes with regard to response to other pupils, or initiated talk to the teacher. Statistically, pupils initiated significantly more talk to other pupils in the experimental classes than in the control classes, $z = -3.55$, with $P < .05$.

Other classroom behaviors studied included silences and periods of confusion. Table 4 presents the descriptive and statistical data for these behaviors. Statistically, control classes exhibited significantly less silence, $z = -4.96$, with $P < .05$, and significantly

more confusion, z = 4.96, with P < .05, than did the experimental classes.

TABLE 3

VICS PROPORTIONS, DIFFERENCES, STANDARD ERROR OF THE DIFFERENCE OF THE PROPORTIONS AND z SCORES FOR PUPIL TALK: RESPONSES AND INITIATED TALK TO THE TEACHER AND OTHER PUPILS

Category	Control N	Control p	Exper. N	Exper. p	Diff	SE_{D_p}	z Score
Responses							
To Teacher							
Narrow	251	.18	238	.16	.02	.005	3.80*
Broad	64	.05	126	.09	-.04	.010	-3.95*
To Pupils	10	.007	14	.009	-.002	.002	-1.03
Initiated Talk							
To Teacher	106	.07	127	.09	-.02	.667	- .03
To Pupils	11	.01	22	.02	-.01	.003	-3.55*

* Significant at or beyond .05 level.

TABLE 4

VICS PROPORTIONS, DIFFERENCES, STANDARD ERROR OF THE DIFFERENCE OF THE PROPORTIONS AND z SCORES FOR OTHER TALK: SILENCE AND CONFUSION

Category	Control N	Control p	Exper. N	Exper. p	Diff	SE_{D_p}	z Score
Silence	26	.02	40	.03	-.01	.002	-4.96*
Confusion	22	.02	0	.00	.02	.004	4.96*

* Significant at or beyond .05 level.

FIRO-B Data

After the VICS observation for each class was completed, cooperating teachers were asked to complete the FIRO-B instrument. Scaled scores were derived from the answers given and *t* tests for significant differences of the means were calculated. Table 5 presents the FIRO-B descriptive and statistical data. No statistically significant differences were found.

TABLE 5

FIRO-B SCORES FOR CONTROL AND EXPERIMENTAL CLASSES

FIRO-B Means, Standard Deviations, Mean Differences, and *t* Scores for Control and Experimental Classes

	Control		Experimental	
Scales	M	SD	M	SD
1. e^I	6.00	1.41	6.00	.89
2. w^I	6.17	1.84	5.83	2.32
3. e^C	2.17	1.47	2.00	2.37
4. w^C	2.50	1.38	1.50	1.22
5. e^A	5.50	1.87	4.66	1.63
6. w^A	7.33	1.63	6.33	1.63

	M Diff	*t* Score	
1. e^I	.00	.00	NS
2. w^I	.34	.28	NS
3. e^C	.17	.15	NS
4. w^C	1.00	1.33	NS
5. e^A	.84	.83	NS
6. w^A	1.00	1.06	NS

df = 5 for all tests

Sums (Σ) within Need Areas (e + w), and Differences (d) within Need Areas (e - w), and Over-all

Sum (e + w)	Control	Experimental
ΣI	12.17	11.83
ΣC	4.67	3.50
ΣA	12.83	11.00
Σ	29.67	26.33

Diff (e - w)	Control	Experimental
d^I	- .166	.166
d^C	- .333	.500
d^A	-1.833	-1.666
d	-2.333	-1.000

My Class Inventory Data

At the same time that cooperating teachers were completing the FIRO-B instrument, pupils in each class were asked to complete the MCI. Scaled scores were obtained and t tests for significant differences of the means were calculated. Table 6 presents the MCI descriptive and statistical data. The control classes were perceived by pupils as significantly less competitive than the experimental classes, $t = 2.63$, $P < .05$. No other statistically significant differences were found.

TABLE 6

MCI MEANS, STANDARD DEVIATIONS, MEAN DIFFERENCES, AND *t* SCORES FOR CONTROL AND EXPERIMENTAL CLASSES

	Control		Experimental	
Scales	M	SD	M	SD
1. Satisfaction	21.04	.98	18.14	3.60
2. Friction	19.20	1.57	20.87	1.63
3. Competitiveness	20.86	.69	21.87	.64
4. Difficulty	14.93	.86	15.59	1.64
5. Cohesiveness	21.91	1.87	20.15	1.63

	M Diff	*t* Score	
1. Satisfaction	2.90	1.91	NS
2. Friction	1.67	1.81	NS
3. Competitiveness	1.01	2.63*	
4. Difficulty	.66	.88	NS
5. Cohesiveness	1.76	1.75	NS

df = 5 for all tests
*$p < .05$

Analysis of Data

Nine research questions were identified for investigation. Questions 1, 2, and 3 dealt with verbal behavior patterns. The statistical analysis confirmed that no significant differences in verbal behavior patterns existed among the control classes or among the experimental classes, as approached by questions 1 and 2, and measured by the VICS. Question 3 was concerned with differences in verbal behavior patterns between the control and experimental

classes and was confirmed. There were statistically significant differences between some of the subsets within the larger set of all teacher talk. Experimental teachers discussed, explained, and oriented significantly more than the control teachers (category #1). Control teachers gave significantly more directions (category #2) to their pupils than did the teachers of the experimental classes. There were no statistically significant differences between the two groups with regard to narrow or broad question types (categories #3 and #4). The teachers of the experimental classes accepted significantly more pupil ideas (category #5a) than the control teachers. Teachers of the control classes rejected significantly more pupil behaviors (category #6b).

Statistical analysis of all pupil talk indicated significantly more pupil talk in the classes of experimental teachers than in classes of control teachers. In the area of response to teacher questions, pupils in control classes answered with significantly more narrow responses (category #7a), while pupils in experimental classes answered with significantly more broad responses (category #7b). Pupil initiated talk to the teacher and response to other pupils (categories #8 and #9) showed no significant statistical differences. Statistically, the experimental classes had significantly more pupil talk to other pupils than did the control classes (category #10).

With regard to silence and confusion (categories #11 and #12), statistically significant differences were found. The experimental classes had more silence and the control classes had more confusion.

Research questions 4, 5, and 6 were concerned with differences in the characteristic behaviors of the teachers as measured by the FIRO-B. The results of the statistical analysis confirmed that there were no significant differences in the characteristic behaviors among or between the control and experimental teachers.

Research questions 7, 8, and 9 dealt with classroom attitudes of pupils as measured by the MCI. It was confirmed that no statistically significant differences existed among or between the control and experimental classes, with one exception. The pupils in the control classes perceived significantly less competitiveness in their classes than did the pupils in the experimental classes.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

As stated in Chapter I, the purpose of this investigation was to compare the verbal interaction behaviors of classes when the teachers had preservice training in interaction process analysis with the same behaviors of classes when the teachers had no preservice training in interaction process analysis. The intent of this investigation was to describe and compare 1) verbal interaction behavior patterns present, 2) pupil classroom attitudes, and 3) characteristic teacher behaviors.

The subjects for this investigation were six classroom teachers who had had preservice training in interaction process analysis as presented in Professional Semester II and their pupils - the experimental group, and six classroom teachers who had not had preservice training in interaction process analysis and their pupils - the control group. It was felt that the sample of teachers selected for the experimental group represented those teachers whose preservice conceptualization and control of interaction process analysis was unusual. This

investigation attempted to describe the verbal interaction patterns of this small, select sample, and was intended for limited generalization to a program where students were given training in interaction process analysis.

Data from the experimental and control groups were gathered during live observations of the classrooms. The coefficient of reliability of the observer, in this case the researcher, was established and maintained at .91 or greater before and during the time the data were gathered.

Verbal interaction behaviors for all classes were systematically coded and analyzed by using the Verbal Interaction Category System (VICS). Seventeen classroom verbal interaction behaviors made up the six categories studied: all teacher talk - explaining and directing, questioning, and reinforcement; all pupil talk - initiated talk, and responses; all other verbal behaviors - silences and confusion. Statistical analysis of the proportions of the behaviors yielded z scores indicating degree of differences between the control and experimental groups.

Research questions 1, 2, and 3 dealt with differences in classroom verbal interaction behaviors. Research question 3 was confirmed by the finding. There were significant differences between the groups with regard to all pupil talk. Statistically significant

differences were found within each of these areas and within the area of other verbal interaction behaviors as well.

Experimental teachers, explained more, directed less, accepted pupil ideas more and rejected fewer pupil behaviors, all at $P < .05$. Pupils in the experimental classes responded with more broad answers, $P < .05$, and initiated more talk to other pupils, $P < .05$. Analysis of other verbal interaction behaviors showed more silences in the experimental classes and less confusion, $P < .05$.

Perceived characteristic behaviors of teachers were measured through use of the Fundamental Interpersonal Relations Orientation - Behavior (FIRO-B). The fifty-four items pertained to six personality dimensions - expressed and wanted inclusion, expressed and wanted control, and expressed and wanted affection. Significant differences between the control and experimental groups were determined by calculation of t tests.

Research questions 4, 5, and 6 dealt with differences in perceived characteristic behaviors of the teachers. As anticipated, no significant differences between the groups were reflected in the findings. Upon examination of the means of the FIRO-B scores it was noted that the control teachers scored slightly higher on all of the dimensions except expressed inclusion, which was the same as for the experimental group. Since both groups scored similarly

on the scales it was concluded that the teachers' perceived characteristic behaviors were similar.

The My Class Inventory (MCI) was used to assess pupil classroom attitudes. Forty-five items dealt with five classroom attitude areas: satisfaction, friction, competitiveness, difficulty, and cohesiveness. Significant differences between control and experimental groups were determined by calculation of t tests. Research questions 7, 8, and 9 dealt with differences in pupil classroom attitudes. No significant differences were found between the two groups, except in the area of competitiveness. The control classes were perceived by pupils to be significantly less competitive than the experimental classes.

Though no other statistically significant differences were found in pupil classroom attitudes, the control classes indicated more satisfaction, less friction, less difficulty, and more cohesiveness than did the experimental classes. These findings were contrary to those of other researchers (Flanders, 1970, Chanan, 1973, and Bennett, 1976), who found pupils' attitudes were more positive in classes where the teacher's verbal behaviors were similar to those of the experimental group. Since the control and experimental classes differed, but not significantly so, it was concluded that the two groups were similar with regard to pupil classroom attitudes.

Differences in verbal interaction behaviors between the groups were expected. Teachers in both groups asked more narrow than broad questions, probably due to the nature of the review lessons observed. Pupils in experimental classes, however, answered with more broad responses than did pupils in control classes, were involved in more pupil to pupil talk, and experimental teachers rejected fewer pupil behaviors. The use of pupil ideas might indicate, as suggested by Hennings (1975), that the experimental teachers had more democratic classrooms. Flanders (1960) found more pupil growth in classes that were described by the kinds of verbal interaction patterns found in the experimental classes. Flanders' findings were supported by Rosenshine (1968) and by Hurt, et. al., (1978). Amidon and Giammatteo (1967) reported that teachers considered superior by their principals and supervisors had classes in which the verbal behavior patterns were similar to those of the experimental teachers of this investigation.

Other research evidence cited in the Review of Related Literature dealt with the impact of training in interaction analysis and supports the findings of this investigation. The classes with teachers trained in interaction process analysis exhibited similar verbal interaction patterns to those of studies conducted by Kirk (1964), Furst (1965), and Hough and Ober (1966). The teachers

talked less, gave fewer directions, used pupils' ideas more, and allowed more pupil to pupil talk.

It seemed, since all observations were made in elementary classes with young students, that some instances of teacher acceptance or rejection of pupil feelings would have been recorded. It should be noted, however, that in all 240 minutes of observations, no instances of this category were observed. The nature of the lessons coded may help to explain the lack of this teacher behavior, in that review situations afford little or no opportunity for pupils to express their feelings to be accepted or rejected by the teacher. Research by Brophy and Good (1974) support these findings.

Regarding silences and confusion, it was noted that while the control and experimental classes both had silences, only the control group had periods of confusion. This might account for the significantly greater occurrence of teacher rejection of pupil behaviors in the control group, since it was necessary for the control teachers to criticize and redirect pupil behaviors when the confusion occurred.

Conclusions

The general overview of findings were as follows:

1. Verbal interaction patterns of the classes with teachers who had preservice training in interaction

process analysis differed significantly from the verbal interaction patterns of the classes with teachers who had no preservice training in interaction process analysis.

2. Perceived characteristic behaviors of the teachers with preservice training in interaction process analysis did not differ significantly from the perceived characteristic behaviors of the teachers with no interaction process analysis training.

3. Pupil classroom attitudes of classes which had teachers with preservice training in interaction process analysis did not differ significantly from pupil classroom attitudes of classes which had teachers with no interaction process analysis training, except in the area of competitiveness.

In view of these findings it was concluded that the training received by the experimental teachers in Professional Semester II had an impact upon their verbal interaction behaviors in their classrooms. It would seem likely that other teachers who had interaction process analysis training in Professional Semester II would display similar verbal interaction behaviors in their classes to those of the experimental group of this investigation.

Recommendations for Further Research

Suggestions for additional research are given below:

1. A study which first identifies pupil classroom attitudes and then analyzes verbal interaction patterns related to the pupil classroom attitudes.

2. A study similar to this one using a larger population, varying the controls for class grade, and increasing the years of experience for the experimental and control groups.

3. A longitudinal study of the correlation between verbal interaction behaviors of teachers with training in interaction process analysis in their first year of teaching with their verbal interaction behaviors in subsequent years of teaching and related to desirable pupil learning outcomes.

4. A longitudinal study of the verbal interaction behaviors of teachers with training in interaction process analysis given feedback on their verbal behaviors with the verbal interaction behaviors of teachers trained in interaction process analysis but not given feedback of their verbal behaviors, related to desirable pupil traits.

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APPENDIX A

FUNDAMENTAL INTERPERSONAL RELATIONS

ORIENTATION - BEHAVIOR

(FIRO-B)


FIRO-B
1977 Edition
WILL SCHUTZ, Ph.D.
DIRECTIONS: This questionnaire explores the typical ways you interact with people. There are no "right" or wrong answers.
Sometimes people are tempted to answer questions like these in terms of what they think a person should do. This is not what is wanted here. We would like to know how you actually behave.
Some items may seem similar to others. However, each item is different so please answer each one with-out regard to the others. There is no time limit, but do not debate long over any item.
NAME
GROUP
DATE
AGE
FEMALE
MALE

For each statement below, decide which of the following answers best applies to you. Place the number of the answer in the box at the left of the statement. Please be as honest as you can.

1. never 2. rarely 3. occasionally 4. sometimes 5. often 6. usually

☐ 1. I try to be with people.

☐ 2. I let other people decide what to do.

☐ 3. I join social groups.

☐ 4. I try to have close relationships with people.

☐ 5. I tend to join social organizations when I have an opportunity.

☐ 6. I let other people strongly influence my actions.

☐ 7. I try to be included in informal social activities.

☐ 8. I try to have close, personal relationships with people.

☐ 9. I try to include other people in my plans.

☐ 10. I let other people control my actions.

☐ 11. I try to have people around me.

☐ 12. I try to get close and personal with people.

☐ 13. When people are doing things together I tend to join them.

☐ 14. I am easily led by people.

☐ 15. I try to avoid being alone.

☐ 16. I try to participate in group activities.

For each of the next group of statements, choose one of the following answers:

1. nobody 2. one or two people 3. a few people 4. some people 5. many people 6. most people

☐ 17. I try to be friendly to people.

☐ 18. I let other people decide what to do.

☐ 19. My personal relations with people are cool and distant.

☐ 20. I let other people take charge of things.

☐ 21. I try to have close relationships with people.

☐ 22. I let other people strongly influence my actions.

☐ 23. I try to get close and personal with people.

☐ 24. I let other people control my actions.

☐ 25. I act cool and distant with people.

☐ 26. I am easily led by people.

☐ 27. I try to have close, personal relationships with people.

For each of the next group of

1. nobody 2. one or two people

☐ 28. I like people to in

☐ 29. I like people to ac with me.

☐ 30. I try to influence ple's actions.

☐ 31. I like people to i their activities.

☐ 32. I like people to a

☐ 33. I try to take cha am with people.

☐ 34. I like people to activities.

For each of the next group

1. never 2. rarely

☐ 41. I try to be the dc I am with people

☐ 42. I like people to

☐ 43. I like people to

☐ 44. I try to have otl want done.

☐ 45. I like people to activities.

☐ 46. I like people to toward me.

☐ 47. I try to influen ple's actions.

For each of the next group of statements, choose one of the following answers:

1. nobody 2. one or two people 3. a few people 4. some people 5. many people 6. most people

- ☐ 28. I like people to invite me to things.
- ☐ 29. I like people to act close and personal with me.
- ☐ 30. I try to influence strongly other people's actions.
- ☐ 31. I like people to invite me to join in their activities.
- ☐ 32. I like people to act close toward me.
- ☐ 33. I try to take charge of things when I am with people.
- ☐ 34. I like people to include me in their activities.
- ☐ 35. I like people to act cool and distant toward me.
- ☐ 36. I try to have other people do things the way I want them done.
- ☐ 37. I like people to ask me to participate in their discussions.
- ☐ 38. I like people to act friendly toward me.
- ☐ 39. I like people to invite me to participate in their activities.
- ☐ 40. I like people to act distant toward me.

For each of the next group of statements, choose one of the following answers:

1. never 2. rarely 3. occasionally 4. sometimes 5. often 6. usually

- ☐ 41. I try to be the dominant person when I am with people.
- ☐ 42. I like people to invite me to things.
- ☐ 43. I like people to act close toward me.
- ☐ 44. I try to have other people do things I want done.
- ☐ 45. I like people to invite me to join their activities.
- ☐ 46. I like people to act cool and distant toward me.
- ☐ 47. I try to influence strongly other people's actions.
- ☐ 48. I like people to include me in their activities.
- ☐ 49. I like people to act close and personal with me.
- ☐ 50. I try to take charge of things when I'm with people.
- ☐ 51. I like people to invite me to participate in their activities.
- ☐ 52. I like people to act distant toward me.
- ☐ 53. I try to have other people do things the way I want them done.
- ☐ 54. I take charge of things when I'm with people.

FIRO-B SUMS AND DIFFERENCES

CONTROL TEACHERS

C_1

	I	C	A	Sum (I + C + A)
e	6	3	7	16
w	4	2	6	12
sum (e + w)	10	5	13	Total Sum 28
diff (+ or -) (e - w)	2	1	1	Total Diff 4

C_2

	I	C	A	Sum (I + C + A)
e	4	2	4	10
w	6	4	7	17
sum (e + w)	10	6	11	Total Sum 27
diff (+ or -) (e - w)	-2	-2	-3	Total Diff -7

C_3

	I	C	A	Sum (I + C + A)
e	8	1	6	15
w	7	3	8	18
sum (e + w)	15	4	14	Total Sum 33
diff (+ or -) (e - w)	1	-2	-2	Total Diff -3

C_4

	I	C	A	Sum (I + C + A)
e	5	4	3	12
w	4	1	5	10
sum (e + w)	9	5	8	Total Sum 22
diff (+ or -) (e - w)	1	3	-2	Total Diff 2

C_5

	I	C	A	Sum (I + C + A)
e	6	0	5	11
w	8	4	9	21
sum (e + w)	14	4	14	Total Sum 32
diff (+ or -) (e - w)	-2	-4	-4	Total Diff -10

C_6

	I	C	A	Sum (I + C + A)
e	7	3	8	18
w	8	1	9	18
sum (e + w)	15	4	17	Total Sum 36
diff (+ or -) (e - w)	-1	2	-1	Total Diff 0

FIRO-B SUMS AND DIFFERENCES

EXPERIMENTAL TEACHERS

E_1

	I	C	A	Sum (I + C + A)
e	5	0	3	8
w	6	1	5	12
sum (e + w)	11	1	8	Total Sum 20
diff (+ or -) (e - w)	-1	-1	-2	Total Diff -4

E_2

	I	C	A	Sum (I + C + A)
e	7	5	6	18
w	6	1	7	14
sum (e + w)	13	6	13	Total Sum 32
diff (+ or -) (e - w)	1	4	-1	Total Diff 4

E_3

	I	C	A	Sum (I + C + A)
e	6	0	4	10
w	7	3	5	15
sum (e + w)	13	3	9	Total Sum 25
diff (+ or -) (e - w)	-1	-3	-1	Total Diff -5

E_4

	I	C	A	Sum (I + C + A)
e	5	5	3	13
w	2	0	7	9
sum (e + w)	7	5	10	Total Sum 22
diff (+ or -) (e - w)	3	5	-4	Total Diff 4

E_5

	I	C	A	Sum (I + C + A)
e	6	1	7	14
w	5	1	5	11
sum (e + w)	11	2	12	Total Sum 25
diff (+ or -) (e - w)	1	0	2	Total Diff 3

E_6

	I	C	A	Sum (I + C + A)
e	7	1	5	13
w	9	3	9	21
sum (e + w)	16	4	14	Total Sum 34
diff (+ or -) (e - w)	-2	-2	-4	Total Diff -8

APPENDIX B

MY CLASS INVENTORY

(MCI)

DIRECTIONS

This is not a test. The questions inside are to find out what your class is like. Please answer all the questions.

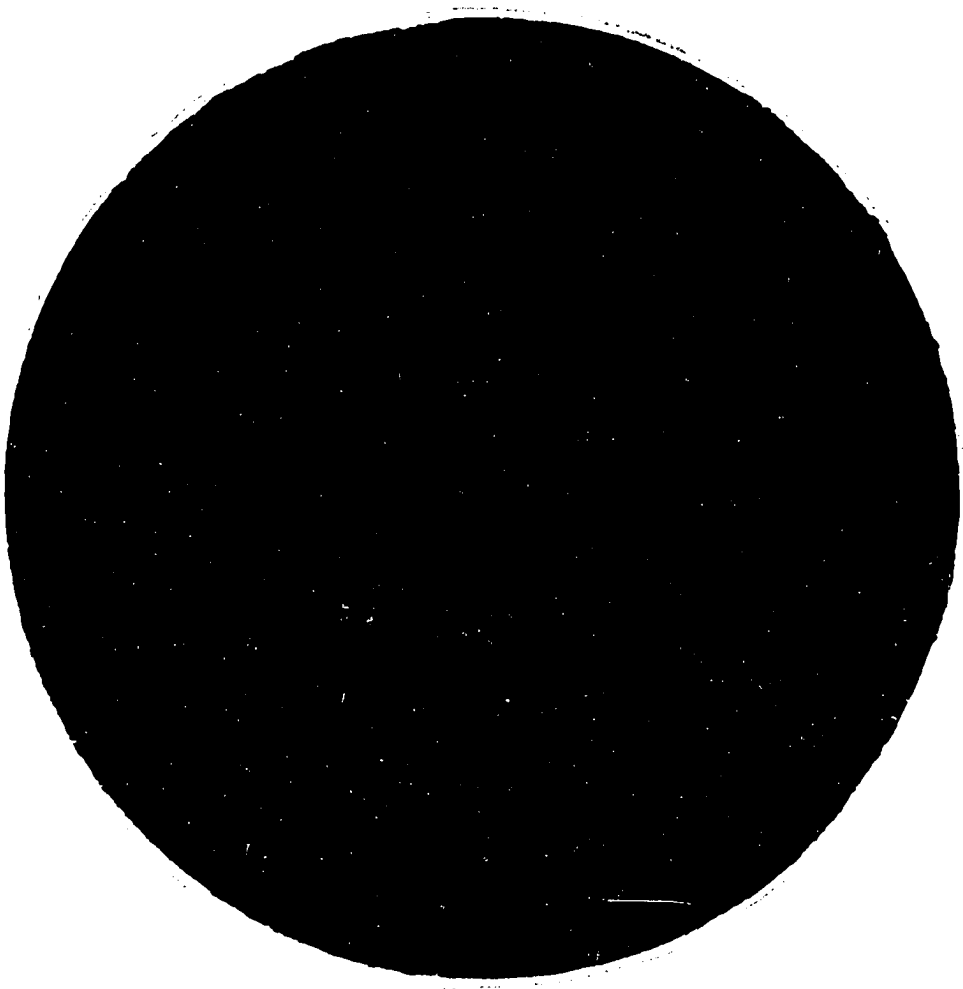
Each sentence is meant to describe your class. If you agree with the sentence circle Yes. If you do not agree with the sentence circle No.

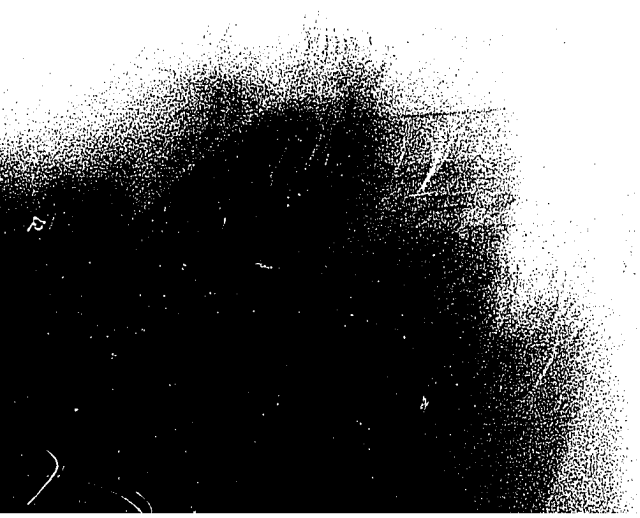
EXAMPLE	Circle Your Answer
1. Most children in the class are good friends.	
If you think that most children in the class are good friends, circle the Yes like this:	(Yes) No
If you do not think that most children in the class are good friends, circle the No like this:	Yes (No)

Now turn the page and answer all the questions about your class.

		Circle Your Answer	
1.	The pupils enjoy their schoolwork in my class.	Yes	No
2.	Children are always fighting with each other.	Yes	No
3.	The same people always do the best work in our class.	Yes	No
4.	In our class the work is hard to do.	Yes	No
5.	My best friends are in my class.	Yes	No
6.	Some of the children in our class are mean.	Yes	No
7.	Most pupils are pleased with the class.	Yes	No
8.	Children often race to see who can finish first.	Yes	No
9.	Many children in the class play together after school.	Yes	No
10.	Most children can do their schoolwork without help.	Yes	No
11.	Some pupils don't like the class.	Yes	No
12.	Most children want their work to be better than their friend's work.	Yes	No
13.	Many children in our class like to fight.	Yes	No
14.	Only the smart people can do the work in our class.	Yes	No
15.	In my class everybody is my friend.	Yes	No

		Circle Your Answer	
16.	Most of the children in my class enjoy school.	Yes	No
17.	Some pupils don't like other pupils.	Yes	No
18.	Some pupils feel bad when they do not do as well as the others.	Yes	No
19.	In my class I like to work with others.	Yes	No
20.	In our class all the pupils know how to do their schoolwork.	Yes	No
21.	Most children say the class is fun.	Yes	No
22.	Some people in my class are not my friends.	Yes	No
23.	Children have secrets with other children in the class.	Yes	No
24.	Children often find their work hard.	Yes	No
25.	Most children don't care who finishes first.	Yes	No
26.	Some children don't like other children.	Yes	No
27.	Some pupils are not happy in class.	Yes	No
28.	All of the children know each other well.	Yes	No
29.	Only the smart pupils can do their work.	Yes	No
30.	Some pupils always try to do their work better than the others.	Yes	No





		Circle Your Answer	
31.	Children seem to like the class.	Yes	No
32.	Certain pupils always want to have their own way.	Yes	No
33.	All pupils in my class are close friends.	Yes	No
34.	Many pupils in our class say that school is easy.	Yes	No
35.	In our class some pupils always want to do best.	Yes	No
36.	Some of the pupils don't like the class.	Yes	No
37.	Children in our class fight a lot.	Yes	No
38.	All of the pupils in my class like one another.	Yes	No
39.	Some pupils always do better than the rest of the class.	Yes	No
40.	Schoolwork is hard to do.	Yes	No
41.	Certain pupils don't like what other pupils do.	Yes	No
42.	A few children in my class want to be first all of the time.	Yes	No
43.	The class is fun.	Yes	No
44.	Most of the pupils in my class know how to do their work.		
45.	Children in our class like each other as friends.	Yes	No

This instrument was developed at Harvard University by Gary J. Anderson and Herbert J. Walberg, May 1968. Revised, January 1969, by G. J. Anderson and Ronald E. Cayne, Faculty of Education, McGill University.

SCALES AND RELIABILITIES OF THE
MY CLASS INVENTORY

Scale	Items	Individual Reliability[a]
Satisfaction	1, 7, 11*, 16, 21, 27*, 31, 36*, 43	.77
Friction	2, 6, 13, 17, 22, 26, 32, 37, 41	.70
Competitiveness	3, 8, 12, 18, 25*, 30, 35, 39, 42	.56
Difficulty	4, 10*, 14, 20*, 24, 29, 34*, 40, 44*	.56
Cohesiveness	5, 9, 15, 19, 23, 28, 33, 38, 45	.54

Note: Score: Yes = 3, No = 1. Items with an asterisk must have their polarities reversed, i.e., yes = 1, no = 3.

[a]Based on data from 655 subjects, 1969.

MY CLASS INVENTORY

CONTROL CLASSES

	C_1		C_2		C_3		C_4		C_5		C_6	
Item	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1.	10	12	12	10	5	15	12	7	21	2	11	8
2.	3	19	4	18	12	8	7	12	1	22	7	12
3.	17	5	10	11	17	3	9	10	7	16	9	10
4.	9	13	11	11	9	11	8	11	1	22	6	13
5.	16	6	19	3	18	2	11	8	16	7	17	2
6.	12	10	15	7	10	10	9	10	13	9	11	8
7.	21	1	19	3	17	3	19	0	21	2	17	2
8.	13	9	14	8	8	12	10	9	17	6	12	7
9.	21	1	16	6	17	3	16	3	18	4	11	8
10.	19	3	21	1	15	5	15	4	22	1	16	3
11.	12	10	9	13	13	7	9	10	10	13	6	12
12.	14	8	16	6	10	10	10	9	20	3	11	8
13.	8	14	10	12	11	9	5	14	5	17	7	12
14.	8	14	8	14	4	16	2	17	1	21	4	15
15.	16	6	12	10	13	7	7	12	13	9	11	8
16.	16	6	16	5	16	4	9	10	9	14	10	9
17.	14	8	18	4	15	5	19	0	22	1	15	4
18.	17	4	16	6	16	4	15	4	21	2	16	3
19.	16	6	18	4	19	1	15	4	21	2	16	3
20.	11	11	11	11	5	15	9	10	10	13	7	12
21.	13	9	14	7	15	5	10	9	18	5	15	4
22.	7	15	13	9	8	12	12	7	18	5	8	11
23.	18	4	21	1	19	1	18	1	20	3	16	2
24.	14	7	16	6	15	5	12	7	16	6	13	6
25.	18	4	16	6	14	6	15	4	17	6	13	6
26.	10	12	16	6	13	7	17	2	22	1	11	8
27.	14	8	14	8	10	11	9	11	10	13	5	14
28.	21	1	21	1	21	1	16	4	19	4	18	1
29.	8	14	8	14	7	15	3	17	2	21	6	13
30.	11	11	11	11	19	3	13	7	16	7	15	4
31.	20	2	20	2	19	3	17	3	22	1	17	2
32.	9	12	9	12	21	1	18	2	17	6	13	6
33.	16	6	16	6	9	13	7	13	2	21	12	7
34.	16	6	19	3	12	8	8	10	10	13	13	6
35.	18	4	17	4	16	4	18	0	21	1	18	1
36.	11	11	12	10	11	9	11	7	10	12	5	14

37.	5	17	10	12	8	12	3	15	3	20	5	14
38.	14	7	5	17	7	13	5	13	8	15	11	8
39.	13	9	16	5	18	2	17	1	19	4	16	3
40.	14	7	7	15	6	14	6	12	3	20	4	15
41.	13	9	19	3	19	1	18	0	17	1	13	6
42.	13	9	20	2	11	9	14	4	18	5	17	2
43.	20	2	19	3	16	4	16	2	21	2	19	0
44.	20	2	20	1	17	3	14	4	10	2	17	2
45.	20	2	17	5	6	4	12	6	16	7	16	3

	E_1		E_2		E_3		E_4		E_5		E_6	
Item	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1.	14	6	10	2	5	19	14	7	3	17	13	7
2.	4	16	4	8	11	13	9	12	7	13	11	8
3.	10	10	7	5	11	13	5	16	16	4	11	9
4.	5	15	0	12	9	15	7	13	7	13	9	11
5.	13	7	10	2	19	5	15	7	16	4	14	6
6.	14	5	7	5	20	3	17	4	8	12	17	3
7.	18	2	12	0	12	11	17	4	9	11	16	4
8.	12	7	10	2	16	8	12	9	9	10	14	6
9.	13	7	6	6	15	9	10	11	9	10	17	3
10.	18	2	12	0	13	10	17	4	15	5	16	4
11.	11	9	9	3	20	4	13	8	17	3	10	10
12.	16	4	5	7	19	5	14	6	13	7	17	3
13.	5	15	4	8	22	2	9	12	5	15	9	11
14.	1	19	2	10	2	22	4	17	3	17	12	8
15.	4	16	6	6	6	18	9	12	6	14	10	10
16.	12	8	12	0	5	19	14	7	3	17	11	9
17.	17	3	10	2	23	1	19	2	16	4	18	2
18.	19	1	11	1	19	5	19	2	15	5	14	6
19.	19	1	12	0	24	0	18	3	16	4	19	1
20.	4	16	6	6	2	22	9	12	2	18	12	7
21.	10	10	11	1	7	17	10	21	3	16	9	11
22.	17	3	9	3	16	8	10	11	19	1	6	14
23.	20	0	8	4	22	2	18	3	19	1	19	1
24.	17	3	8	4	21	3	17	4	19	1	8	12
25.	13	7	9	3	14	10	12	9	14	6	13	7
26.	19	1	10	2	23	1	18	3	18	2	14	6
27.	17	3	8	4	21	3	16	5	17	3	11	9
28.	14	6	12	0	14	5	19	2	12	7	20	0
29.	5	15	3	9	2	21	3	18	3	17	9	11
30.	19	1	6	6	24	0	16	5	18	1	18	2

31.	16	4	12	0	14	10	20	1	10	10	18	2
32.	17	3	4	8	19	5	19	2	20	0	18	2
33.	5	15	9	3	6	18	10	11	4	16	10	10
34.	9	10	9	3	8	16	13	7	6	14	11	9
35.	19	0	9	3	22	1	21	0	20	0	18	2
36.	16	3	4	8	21	3	17	4	19	1	12	8
37.	2	17	4	8	16	8	9	12	6	14	13	7
38.	4	15	8	4	2	22	10	10	2	18	8	12
39.	15	4	9	3	22	2	14	7	18	2	15	5
40.	5	15	0	12	13	11	8	13	8	12	5	15
41.	18	1	7	5	22	2	16	4	17	3	12	8
42.	18	1	8	4	19	5	19	2	17	3	19	1
43.	17	2	10	2	15	9	15	6	8	12	18	2
44.	15	4	11	1	18	6	20	1	17	3	17	3
45.	9	10	9	3	17	7	16	5	12	8	13	7

APPENDIX C

THE VERBAL INTERACTION

CATEGORY SYSTEM

(VICS)

THE VERBAL INTERACTION CATEGORY SYSTEM

(VICS)*

The Verbal Interaction Category System is based upon the Flanders system of Interaction Analysis, and contains five major categories for analyzing classroom verbal behavior. They are: teacher-initiated talk, teacher response, pupil response, pupil initiated talk, and other.

This system requires that persons planning to use them in order to study verbal behavior in the classroom begin by memorizing the categories. Once these are learned so that response is automatic, tapes of various teaching situations should be used for practicing the tallying of categories. A category is tallied every three seconds, in sequence, in a column, indicating the interaction which is occurring at the time. If the verbal behavior changes before the three-second interval ends, this change is always recorded. Approximately twenty numbers are written per minute. Untimately, in the VICS, the categories are entered in a seventeen-row by seventeen-column table called a matrix, which presents information clearly and succinctly about the type, sequence, and amount of verbal behavior which has occurred.

The recorder transfers the category numbers which have been tallied in the classroom onto the matrix two at a time, thus indicating the general sequence of interaction. When the recorder finishes his tallying, he will pair the numbers in the folowing fashion.

$\binom{2}{9}$ 1st pair

2nd pair $\binom{9}{6b}$ 3rd pair

4th pair $\binom{6b}{1}$ 5th pair

6th pair $\binom{1}{4}$ nth pair

$\binom{4}{4}$

The first pair is 2 - 9, the second pair is 9 - 6b, the third pair is 6b -1, and so on. The particular cell in which the tabulation of the pair of numbers is made

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* From Improving Teaching: The Analysis of Classroom Verbal Interaction, by Edmund Amidon and Elizabeth Hunter, Holt, Rinehart and Winston, Inc., New York, 1967.

is determined by using the first number in the pair to indicate the row, and second number in the pair to indicate the column. Thus, 2 - 9 would be shown by a tabulation in the cell formed by row 2 and column 9. The second pair, 9 - 6b, would be shown in the cell formed by row 9 and column 6b. The third pair, 6b - 1, is entered in the cell formed by row 6b and column 1. Each pair of numbers overlaps with the previous pair, and each number, except the first and last, is used twice.

Once the tallies are entered on the matrix, then the interaction pattern in the classroom can be interpreted by studying that matrix. Different part of the matrix indicate different kinds of classroom interaction. The matrix indicates the amount, the sequence and the pattern of verbal behavior in the classroom according to the categories delineated in the VICS.

THE VERBAL INTERACTION CATEGORY SYSTEM (VICS)

Teacher Initiated Talk	1.	Gives Information or Opinion:	Presents content or own ideas, explains, orients, asks rhetorical questions. May be short statements or extended lecture.
	2.	Gives Directions:	tells pupil to take some specific action; gives orders; commands.
	3.	Asks Narrow Question:	asks drill and factual questions, questions requiring one or two word replies or yes-or-no answers; questions to which the specific nature of the response can be predicted.
	4.	Asks Broad Question:	asks relatively open-ended questions; questions which are thought-provoding. Apt to elicit longer pupil response than 3.
Teacher Response	5.	Accepts: (5a)	Ideas: reflects, clarifies, encourages or praises ideas of pupils.
		(5b)	Behaviors: responds in ways which commend or encourage pupil behavior.
		(5c)	Feelings: responds in ways which reflect or encourage expression of pupil feelings.
	6.	Rejects: (6a)	Ideas: criticizes, ignores, or discourages pupil ideas.
		(6b)	Behaviors: discourages or criticizes pupil behaviors. Designed to stop or redirect behaviors. May be stated in question form, but differentiated from category 3 or 4, and from category 2, by tone of voice

			and resultant effect on pupils.
		(6c)	Feelings: ignores,discourages, or rejects pupil expression of feelings.
Rupil Response	7. Responds to Teacher	(7a)	Predictably: relatively short replies, usually, which follow category 3. May also follow category 2, i.e., "David, you may read next."
		(7b)	Unpredictably: replies which usually are proceeded by category 4.
	8. Responds to Another Pupil: replies occurring in conversation between pupils.		
Pupil Initiated Talk	9. Initiates Talk to Teacher: statements which pupils direct to teacher without solicitation from teacher.		
	10. Initiates Talk to Another Pupil: statements which pupils direct to another pupil which are not solicited.		
Other	11. Silence: pauses or short periods of silence during a time of classroom conversation.		
	12. Confusion: considerable noise which disrupts planned activities. This category may accompany other categories or may totally preclude the use of other categories.		

VERBAL INTERACTION CATEGORY SYSTEM
FREQUENCIES AND PROPORTIONS OF OBSERVED BEHAVIORS

	Control Classes					
	C_1		C_2		C_3	
Category	n	p	n	p	n	p
1	36	.19	44	.18	33	.13
2	15	.08	25	.10	11	.04
3	25	.13	56	.22	11	.04
4	10	.05	2	.01	24	.10
5a	36	.19	20	.08	7	.03
5b	5	.03	11	.04	18	.07
5c	0	.00	0	.00	0	.00
6a	4	.02	4	.02	2	.01
6b	1	.01	19	.08	29	.12
6c	0	.00	0	.00	0	.00
7a	27	.15	49	.20	11	.04
7b	13	.07	1	.004	29	.12
8	0	.00	0	.00	8	.03
9	11	.06	15	.06	38	.15
10	0	.00	0	.00	10	.04
11	1	.01	4	.02	0	.00
12	1	.01	0	.00	18	.07
Totals	185	1.00	250	1.00	249	1.00

	C_4		C_5		C_6	
Category	n	p	n	p	n	p
1	34	.14	18	.08	27	.11
2	4	.02	4	.02	32	.13
3	46	.18	57	.24	31	.13
4	7	.03	3	.01	2	.01
5a	49	.20	6	.03	36	.15
5b	2	.01	40	.17	22	.09
5c	0	.00	0	.00	0	.00
6a	10	.04	7	.03	7	.03
6b	12	.05	12	.05	8	.03
6c	0	.00	0	.00	0	.00
7a	56	.22	46	.19	62	.26
7b	7	.03	8	.03	6	.03
8	1	.004	1	.004	0	.00
9	17	.07	19	.08	6	.03
10	0	.00	1	.004	0	.00
11	5	.02	14	.06	2	.01
12	0	.00	3	.01	0	.00
Totals	250	1.00	239	1.00	241	1.00

VERBAL INTERACTION CATEGORY SYSTEM
FREQUENCIES AND PROPORTIONS OF OBSERVED BEHAVIORS

	Experimental Classes					
	E_1		E_2		E_3	
Category	n	p	n	p	n	p
1	53	.21	50	.20	35	.14
2	3	.01	3	.01	6	.02
3	41	.16	46	.18	35	.14
4	13	.05	7	.03	0	.00
5a	42	.17	39	.16	34	.14
5b	8	.03	9	.04	15	.06
5c	0	.00	0	.00	0	.00
6a	2	.01	6	.02	11	.04
6b	1	.004	2	.01	8	.03
6c	0	.00	0	.00	0	.00
7a	47	.19	49	.20	45	.18
7b	23	.09	9	.04	0	.00
8	0	.00	0	.00	0	.00
9	8	.03	29	.12	36	.14
10	1	.004	1	.004	8	.03
11	8	.03	0	.00	17	.07
12	0	.00	0	.00	0	.00
Totals	250	1.00	250	1.00	250	1.00

	E_4		E_5		E_6	
Category	n	p	n	p	n	p
1	62	.29	27	.11	33	.13
2	5	.02	2	.01	17	.07
3	11	.05	22	.09	38	.15
4	18	.09	13	.05	4	.02
5a	29	.14	27	.11	40	.16
5b	9	.04	25	.10	13	.05
5c	0	.00	0	.00	0	.00
6a	3	.01	2	.01	8	.03
6b	3	.01	3	.01	10	.04
6c	0	.00	0	.00	0	.00
7a	16	.08	29	.12	52	.21
7b	23	.11	66	.26	5	.02
8	1	.01	7	.03	6	.02
9	24	.11	23	.09	7	.03
10	2	.01	4	.02	7	.03
11	6	.03	0	.00	9	.04
12	0	.00	0	.00	0	.00
Totals	212	1.00	250	1.00	249	1.00

VICS MATRIX DISPLAY - CONTROL CLASS 1

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	14	6	5	3							1			7			
2	5	5		1	1									3			
3	1		2								22						
4											1	9					
5a	6	1	13	5		3			1		2	4		1			
5b	2		2	1													
5c																	
6a	3		1														
6b											1						
6c																	
7a	2				21	1		2								1	
7b			1		11			2									
8																	
9	2	2			3	1					1						1
10																	
11			1														
12		1															

VICS MATRIX DISPLAY - CONTROL CLASS 2

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	8	4	20	1					2		4			3		1	
2	6	7	1						2		5			1		3	
3	9	1	5						1		38			2			
4	1											1					
5a	5	3	7			1			1					3			
5b	2	3	4						2								
5c																	
6a	1	1	1											1			
6b	3	3	7					1	1					4			
6c																	
7a	4	2	11	1	14	9		3	5								
7b					1												
8																	
9	5				5	1			4								
10																	
11									1		2			1			
12																	

VICS MATRIX DISPLAY - CONTROL CLASS 3

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	12	1	2						3					11	1		1
2	1	1	3						3			1		1	1		1
3											11						
4	1	1	1	2					1			16		1			1
5a	2			2					1					2			
5b	3	2	2	5					1					5			
5c																	
6a	1													1			
6b	3	3		4		1			3			4		10	1		
6c																	
7a	1		2	1		4						1		2			
7b	4			4	2	6			2			5	1	1	2		2
8	1	1		1									1		3		1
9	5		1	3	5	5		2	8			1	2	2	2		2
10									4				4	1			1
11																	
12		2		1		2			3					1			9

VICS MATRIX DISPLAY - CONTROL CLASS 4

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	6	2	13	2					1		2			7		1	
2				1										1		1	
3			1					1	4		39					1	
4												6				1	
5a	17		18	2				1	2		6			4			
5b			2														
5c																	
6a	4		1	1							3					1	
6b	1		3		1			1	1		3			2			
6c																	
7a	1		4		37	2		4	2		4			2			
7b	1	1		1	3			1									
8	1																
9	1	1	1		8			2	2				1	1			
10																	
11			3								1	1					
12																	

VICS MATRIX DISPLAY - CONTROL CLASS 5

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	4		8						1			1		4			
2		1	2														1
3			1						3		41			5		7	
4												2					
5a	1		2											3			
5b	5		24	2							1	1		6		1	
5c																	
6a	2		4								1						
6b		1	7						1		1					2	
6c																	
7a			2		3	30		6				4				1	
7b	1	1	2			3								1			
8									1								
9	4	1			3	7		1	2		1						
10																	
11	1		3			1			4		1				1	3	
12			1														2

VICS MATRIX DISPLAY - CONTROL CLASS 6

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	8	6	7	1					1					3		1	
2	3		1						1		24	2		1			
3											31						
4												2					
5a	4	17	9	1	1	3			1								
5b	7	5	9		1												
5c																	
6a	1								1		3			1		1	
6b		2	2								2	2					
6c																	
7a	2	4	1		31	17		6	1								
7b			1		2	1			2								
8																	
9	1				1	1		1	1					1			
10																	
11											2						
12																	

VICS MATRIX DISPLAY - EXPERIMENTAL CLASS 1

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	30		19	3	2						5	1		2		1	
2	2										1						
3	2		4		1				1		38					4	
4				2								12					
5a	14	1	16	4		3					4	5		1		2	
5b	1		2		2			1			1	1		1	1		
5c																	
6a			1								1						
6b																1	
6c																	
7a	8	1	5	1	34	3		1			3			1		1	
7b	3		1	3	9							5		3			
8																	
9	2			1	2	3								2			
10					1												
11	1		2		1						5					2	
12																	

VIC MATRIX DISPLAY - EXPERIMENTAL CLASS 2

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	17	1	13	4	1						1			13			
2	2													1			
3	2		2		1						41						
4			1									6					
5a	10		15			4		1			3	2		5			
5b	3			1	2									2			
5c																	
6a	1		2	1	1						1						
6b	2																
6c																	
7a	5	2	8	1	23	2		3			2			1			
7b	1		3		3							3					
8																	
9	6		2		8	2		2	2					6	1		
10														1			
11																	
12																	

VIC MATRIX DISPLAY - EXPERIMENTAL CLASS 3

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	4	3	11								1			12		2	
2											1			3		2	
3											31			1		3	
4																	
5a	7		10			3			2		3			7	1	1	
5b	2		2		5						2		1	2		1	
5c																	
6a	2		4								4						
6b	2		1						2					2		1	
6c																	
7a	2		1		23	9		6			1			2	1		
7b																	
8																	
9	16		1		6	3		4	3					1	2	1	
10			2					1	1		1			2	1		
11		3	2								1			4	1	6	
12																	

VICS MATRIX DISPLAY - EXPERIMENTAL CLASS 4

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	30	5	2		4							1		14		5	
2	3													1		1	
3											11						
4				4							1	13					
5a	5		6	7		3			1		2	5		3			
5b	1		2	2							2	2					
5c																	
6a	1											1		1			
6b	1		1											1			
6c																	
7a			1		13	2											
7b	1			3	12	4		2	1			1					
8															1		
9	12			1	4			1	1			1		3	1		
10													1	1			
11	4			1										1			
12																	

VICS MATRIX DISPLAY - EXPERIMENTAL CLASS 5

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	6		7	2							1	3		7			
2	1											1					
3	2										20						
4	1											10		1	1		
5a	4		10	5							5	2		1			
5b	4	1		1	3						1	14		1			
5c																	
6a											2						
6b												1		1	1		
6c																	
7a	1		2		15	7		2			1			1			
7b	2	1	2	3	5	13			1			33	2	3	1		
8	1			1		1						2	1		1		
9	7		1	1	3	2			2				1	6			
10					1								3				
11																	
12																	

VICS MATRIX DISPLAY - EXPERIMENTAL CLASS 6

C	1	2	3	4	5a	5b	5c	6a	6b	6c	7a	7b	8	9	10	11	12
1	13	6	9						1		1			2	1		
2	3	2	4		1	1			1		4					1	
3	1										37					1	
4												4					
5a	7	3	16	2		2		2	3		1		1	3			
5b	2	4	5		1											1	
5c																	
6a			2								6						
6b	2		1		1						2			1	2	1	
6c																	
7a	1	1		1	31	9		6	1					1			
7b			1		1	1			1			1					
8			1	1											4		
9	1				5				1								
10	1								1				5				
11	1	1							1		1					5	
12																	

APPENDIX D

INTRA-OBSERVER RELIABILITY

Observer Reliability

The amount of agreement between codings of the same situation is the intra-observer reliability. The formulae used to determine the reliability coefficient for the observer in this study was that of Scott (1955), as adapted by Flanders, 1976), and is called "Pi."

$$\pi = \frac{P_o - P_e}{100 - P_e}$$

where P_o = observed % agreement; % of judgments on which codings agree, and where P_e = % agreement on the basis of chance.

$$= \sum_{i=1}^{k} Pi^2$$

where k = the total number of categories and Pi = the proportion of the entire sample which falls in the ith category.

PRE-PROJECT INTRA-OBSERVER RELIABILITY DATA

Category	Observation A	Observation B	% A	% B	% Diff.	(Ave. %)^2
1	14	16	6.3	7.1	0.8	.4489
2	36	32	16.3	14.3	2.0	2.3409
3	29	27	13.1	12.1	1.0	1.5876
4	4	6	1.8	2.7	0.9	.0563
5a	25	22	11.3	9.8	1.5	1.1130
5b	5	7	2.3	3.1	0.8	.0729
5c	0	0	0.0	0.0	0.0	.0000
6a	0	1	0.0	0.4	0.4	.0004
6b	11	10	5.0	4.5	0.5	.2256
6c	0	0	0.0	0.0	0.0	.0000
7a	30	26	13.6	11.6	2.0	1.5876
7b	4	6	1.8	2.7	0.9	.0506
8	12	14	5.4	6.3	0.9	.3422
9	35	37	15.8	16.5	0.7	2.6089
10	16	20	7.2	8.9	1.7	.6480
11	0	0	0.0	0.0	0.0	.0000
12	0	0	0.0	0.0	0.0	.0000
Totals	221	224	99.9	100.0	14.1	11.0829

Category	Observation B	Observation C	% B	% C	% Diff.	(Ave. %)^2
1	16	15	7.1	6.7	0.4	.4761
2	32	33	14.3	14.7	0.4	2.1025
3	27	25	12.1	11.2	0.9	1.3572
4	6	8	2.7	3.6	0.9	.0992
5a	22	20	9.8	8.9	0.9	.8742
5b	7	9	3.1	4.0	0.9	.1260
5c	0	0	0.0	0.0	0.0	.0000
6a	1	1	0.4	0.4	0.0	.0016
6b	10	10	4.5	4.5	0.0	.2025
6c	0	0	0.0	0.0	0.0	.0000
7a	26	24	11.6	10.7	0.9	1.2432
7b	6	8	2.7	3.6	0.9	.0992
8	14	14	6.3	6.3	0.0	.3969
9	37	39	16.5	17.4	0.9	2.8730
10	20	18	8.9	8.0	0.9	.7140
11	0	0	0.0	0.0	0.0	.0000
12	0	0	0.0	0.0	0.0	.0000
Totals	224	224	100.0	100.0	8.0	10.5656

CONCURRENT-PROJECT INTRA-OBSERVER RELIABILITY DATA

Category	Observation A	Observation B	% A	% B	% Diff.	(Ave. %)^2
1	19	20	7.4	7.6	0.2	.5625
2	33	35	12.7	13.3	0.6	1.6900
3	31	29	11.9	11.0	0.9	1.3110
4	10	12	3.8	4.5	0.7	.1722
5a	25	24	9.6	9.1	0.5	.8742
5b	10	11	3.8	4.2	0.4	.1600
5c	0	0	0.0	0.0	0.0	.0000
6a	2	3	0.8	1.1	0.3	.0090
6b	12	11	4.6	4.2	0.4	.1936
6c	0	0	0.0	0.0	0.0	.0000
7a	30	28	11.6	10.6	1.0	1.2321
7b	7	9	2.8	3.4	0.6	.0961
8	17	17	6.6	6.4	0.2	.4225
9	38	39	14.7	14.8	0.1	2.1756
10	22	23	8.5	8.7	0.2	.7396
11	0	0	0.0	0.0	0.0	.0000
12	3	3	1.2	1.1	0.1	.0132
Totals	259	264	100.0	100.0	6.2	9.6516

Category	Observation B	Observation C	% B	% C	% Diff.	(Ave.%)^2
1	20	19	7.6	7.5	0.1	.5700
2	35	34	13.3	13.5	0.2	1.7956
3	29	27	11.0	10.7	0.3	1.1772
4	12	13	4.5	5.2	0.7	.2352
5a	24	22	9.1	8.7	0.4	.7921
5b	11	10	4.2	4.0	0.2	.1681
5c	0	0	0.0	0.0	0.0	.0000
6a	3	3	1.1	1.2	0.1	.0132
6b	11	10	4.2	4.0	0.2	.1681
6c	0	0	0.0	0.0	0.0	.0000
7a	28	27	10.6	10.7	0.1	1.1342
7b	9	9	3.4	3.6	0.2	.1225
8	17	17	6.4	6.7	0.3	.4290
9	39	37	14.8	14.7	0.1	2.1756
10	23	22	8.7	8.7	0.0	.7569
11	0	0	0.0	0.0	0.0	.0000
12	3	2	1.1	0.8	0.3	.9025
Totals	264	252	100.0	100.0	3.2	10.4402